ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C 20554

In the Matter of

Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service	))))	ET Docket No. 95-18 RM-7927

To: The Commission

COMMENTS OF THE STATE OF CALIFORNIA

1. The State of California, Department of General Services, Telecommunications Division (State) operates an extensive microwave communications network throughout California. This system, consisting of 370 paths. is used by various state public safety agencies to provide critical interconnections between remote radio stations and their associated dispatch centers, to provide emergency telephone services, and to provide video surveillance of critical sections of the state's highways. Currently, 96 of the 370 paths are within the 2.1 GHz band (2130-2150 MHz, 2180-2200 MHz) affected by this proceeding.

2. The State opposes the proposal from the COMSAT Corporation (COMSAT) both to share the 2.1 GHz spectrum between existing terrestrial fixed services and the proposed mobile satellite services and to eventually relocate the existing terrestrial fixed services to other spectrum without compensation

3. COMSAT's proposal to share the 2.1 GHz spectrum between existing terrestrial fixed services and the proposed mobile satellite services is flawed in at least two ways. First, COMSAT supposes that sharing will be possible because there will be limited use of mobile satellite services in the early to medium term. While this may be true on a nationwide basis, it ignores the localized effects of their deployment plans. Speculative ventures, such as COMSAT's mobile satellite services, are dependent upon generating capital early in the development process. One method of generating such capital is to target deployment into those areas expected to have the highest demands for service. Such targeted deployment is likely to result in demands that existing terrestrial fixed users abandon the 2.1 GHz spectrum in a timeframe less than the 10 years proposed by COMSAT for sharing. Are those existing terrestrial fixed users who are impacted by these early deployment problems to receive special consideration (compensation)? What is the cut-off time for such special consideration? Is it fair (or reasonable) to compensate one user for being forced to relocate the day before such cut-off date and not compensate another user being forced to relocate the day after such cut-off date?

4. Second, COMSAT's proposal fails to recognize the interference that may be presented **TO** the existing terrestrial fixed microwave systems by the new mobile satellite services. This interference may come from either the satellite or from mobile units operating in the area. Unless the satellites used in the new mobile satellite services are geo-stationary, they will be tracking across the sky and entering the antenna pattern of many different fixed terrestrial systems. Even geo-stationary satellites will be within the antenna patterns of some existing terrestrial fixed microwave users. Similarly, mobile units operating in the area will be passing through the antenna

patterns of many different fixed terrestrial systems as they transit through an area. Thus, the satellites and the mobile units will be presenting interference sources with which the fixed terrestrial systems were not designed to cope. Even if such interference is short-lived, it nonetheless may come at a critical juncture of a communication occurring on the terrestrial system. Any unplanned interruption to a terrestrial fixed system which supports public safety communications is unacceptable.

5. COMSAT's proposal also fails to adequately address the cost to existing terrestrial fixed users to relocate to other spectrum In the Commission's emerging technologies proceeding, the Commission properly held that existing users should be held harmless from being displaced. As a result, proponents of new technologies were required to enter negotiations with the incumbent users and compensate them for the cost of relocating to other spectrum. The State of California has recently completed such negotiations with Pacific Bell Mobile Services to clear spectrum in the 1.9 GHz band for implementation of the new PCS services. While we cannot speak for Pacific Bell Mobile Services, we believe the negotiations went extremely well with minimal delay and resulted in a satisfactory conclusion. Now, COMSAT proposes that they be exempt from such negotiations by allowing existing terrestrial fixed users a ten-year period of time to "naturally" migrate to other spectrum. Such a proposal not only shifts all of the costs of relocation onto the existing users, it also gives COMSAT a financial advantage in competing with the other new technology providers (such as Pacific Bell Mobile Services) who have had to compensate the existing users for the cost of relocation.

6. COMSAT's assumption that ten years is an adequate period of time for existing terrestrial users to have migrated to other spectrum through normal replacement is

fallacious. The State of California has for many years operated its microwave system based upon a 15-20 year replacement cycle for the radio frequency (RF) terminals (transmitters and receivers). This replacement cycle is supported by our experience with equipment failures attributable to age, repair histories, product support from the manufacturers, and changes in technology. Terrestrial fixed microwave terminals are very stable devices which operate continuously and are not subject to much wear and tear.

7. COMSAT's proposal that existing terrestrial fixed users fund the cost of relocating to other spectrum through normal replacement also fails to recognize all of the costs associated with such relocation. The costs go far beyond the cost of the RF terminal. Moving to another frequency band will require that a new frequency study be conducted to find/coordinate the new frequency (at a cost of several hundred dollars). Antennas will have to be replaced so that they operate in the new frequency band (at a cost of one thousand dollars or more). The new antenna may present a higher weight and wind load to the tower, thereby requiring upgrade/replacement of the antenna tower (even the relatively short 100-foot high towers typically used in California cost in excess of $150,000 installed). Most of the existing 2.1 GHz paths provide low density (24 or 48 channel) service utilizing analog multiplexing equipment. All of the available alternative spectrum provide high density (300 channel or greater) service much of which requires use of digital multiplexing equipment. Thus, the existing baseband/multiplex equipment must also be replaced to support operation in the new frequency band (at a cost of several thousand dollars). Power systems, including battery back-up, may have to be upgraded to support the higher current demands of the newer digital equipment (at a

cost of about $7,500). There is even a significant cost differential between the cost of replacement 2.1 GHz low-density analog radios (about $17,000 for a hot-standby terminal) versus the cost of the alternative high-density digital radios (about $55,000 for a hot-standby terminal). Thus, moving to an alternative frequency band may cost $250,000 over the cost of simply replacing the existing radio. While some of these other costs are associated with equipment which must itself be replaced, the cycle for replacement of that other equipment is likely to be on a different schedule than the schedule for the RF terminal. Thus, movement to a different band which is triggered by replacement of the RF terminal does in fact result in unusual other expenses.

8. Furthermore, relocation to an alternative frequency band may also trigger a requirement for development of one or more new facilities. Except for the 960 MHz band, all of the alternative frequency bands are much higher in frequency than the current 2.1 GHz band. This increase in frequency has a significant impact upon the propagation characteristics and may degrade the practical performance of an existing path to an unacceptable level. In this situation, it may be necessary to develop an intermediate facility at which additional equipment can be installed to restore system performance to acceptable levels. In addition to the cost of purchasing radios, antennas, towers, baseband equipment, and other peripheral equipment for this new intermediate facility (at a cost of $300,000 or more), there is also the cost of developing the new facility. A building must be provided. A new road may be required to gain access to the site. Commercial power may have to be brought into the site or an alternative power source identified and implemented. These are not insignificant costs. Furthermore, development of a new site pre-supposes that such development will be

permitted. Environmental concerns about the physical and aesthetic aspects of the facility have stopped many projects in past years.

9. COMSAT estimates the total cost of relocating existing terrestrial fixed users to other spectrum as being $3 Billion and then refers to the cost as being an unreasonable burden upon their company. This cost is no less of a burden upon the myriad of existing users who also have valid reason to use the radio spectrum.

10. While not specific to this proceeding, the State's experience in relocating from the 1.9 GHz fixed microwave band is illustrative of the problems that might be experienced in relocating from the 2.1 GHz band. As stated in Paragraph 5, the State's experience with Pacific Bell Mobile Services (PBMS) has been very positive. Initially, PBMS identified nine of the State's paths in the 1.9 GHz band which potentially impacted their PCS implementation. Of those nine paths, PBMS has identified alternative frequencies and funded replacement for eight of the paths. The ninth path is a long path (67.3 miles) for which no alternative frequency could be identified which would provide an equivalent grade of service over a single hop. To date, they/we have not been able to identify an intermediate site which might be utilized to break the path into two or more segments, each of shorter length which would allow use of higher frequency bands. Due to the cost considerations of developing a new site, the cost of two or more sets of equipment, and the fact that this path will not negatively impact PBMS's immediate plans, relocation of this path is being delayed until a future (unspecified) date. Thus, of the original nine impacted paths, we have found reasonable alternatives for only eight paths and face an unknown future for the ninth path.

11. In conclusion, the State of California believes that COMSAT's proposal to share the 2.1 GHz spectrum is unworkable and will result in unacceptable interference to the State's public safety communications systems. The State also refutes COMSAT's claim that existing terrestrial fixed users can relocate to alternative spectrum at minimum cost through normal replacement programs and opposes the use of taxpayer moneys to fund COMSAT's speculative business venture through the uncompensated relocation of its 2.1 GHz microwave services.

Respectfully Submitted,

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